

Appendix A3

Model Basin Delineation Summary



MODEL BASIN DELINEATION SUMMARY

INTRODUCTION

Hydrologic modeling is a key technical component of the King County Regional Infiltration/Inflow Control Program. Modeling will be used to predict I/I flow from each of approximately 150 local agency modeling basins. Hydrologic models simulate the transformation of rainfall into runoff and groundwater and simulate the portion of water that enters the sewer pipes. Measured flow and rainfall data collected during the 2000-2001 and 2001-2002 wet seasons will be used to calibrate each model basin.

A fundamental input needed for the hydrologic model is the amount of sewer area within each model basin. In order to evaluate future flows, the expected additional sewer area resulting from future development must also be defined. In essence, the area contributing flow to the King County wastewater conveyance system and classification of the service area as sewer or unsewer area are “basic building blocks” needed for developing the hydrologic models.

MODEL BASINS

The model basins were delineated to quantify flow contributed by local sewer systems to various portions of the King County conveyance system. In general, the model basins were also delineated to quantify flow from each local sewer agency, although some model basins contain portions of multiple sewer agencies. The boundary of each model basin is dependent upon the placement of the modeling flow meters installed during the 2000-2001 and 2001-2002 monitoring periods.

A number of data sources, including Sewer Comprehensive Plans and available mapping of local sewers, were used to determine the area tributary to each modeling flow meter. Because the model basins will also be used for future flow estimation, the boundaries of the basins were placed to encompass the future basin limit for eventual build-out conditions, not just the currently sewer area. The actual boundary for each model basin was defined geographically using the King County GIS parcel coverage as a basis.

SERVICE AREA CLASSIFICATION

The primary purpose for classifying the service area was to distinguish between sewer and unsewer areas. Unsewer areas were divided into two major categories, Potentially Sewer and Not Sewer, to provide flexibility for modeling flows from projected future development and alternative growth scenarios. Various sources of information, including Sewer Comprehensive Plans, local sewer maps, aerial photography (2000) and parcel data were used to determine the proper boundaries and classifications.



A general description of the three major service area classifications is provided below. More detailed descriptions of the individual service area classifications are provided in Table 1.

1. Currently Sewered Area – this includes area served by sewers during the flow-monitoring period. Sewered means that the area is served by a sanitary sewer collection system. Sewered areas can be entire parcels or portions of large parcels.
2. Potentially Sewerable Areas – this includes privately held land (developed or undeveloped) that could potentially be sewered in the future. Includes vacant parcels and areas currently served by On Site Sewage disposal systems (OSS) and portions of parcels where part of the parcel is considered sewered but other portions are not sewered.
3. Not Sewerable Areas – this includes publicly owned parklands, sensitive areas (such as steep slopes), freeway rights-of-way, and lakes where development is not expected to occur.

As with delineation of the model basins, parcel boundaries were used primarily as the basis for delineating sewered and unsewered areas. Distinguishing between Potentially Sewerable areas and Not Sewerable areas was somewhat subjective. For properties served by sewer the entire parcel was considered sewered, unless the size of the parcel was greater than 1.5 acres (approx. 60,000 sq ft). The development present on large parcels (greater than 1.5 acres) was reviewed. If the property contained open space that would not contribute to sewer inflow and infiltration then that portion of the property was designated unsewered.

For developed areas containing many small parcels, a threshold of 1.5 acres was also used to differentiate between classifying areas as sewered or unsewered. For example, if an area of small parcels (each less than 1.5 acres) was generally developed and sewered, then all the parcels were classified as sewered. However, if a group of small parcels totaling at least 1.5 acres appeared undeveloped or unsewered, then the appropriate Potentially Sewerable or Not Sewerable classification was used.

A 5 foot buffer will be placed around sewers the do not have any service connections (“orphan sewers”), to include the possible infiltration from the pipes in the sewered area. These buffer areas will be added to the sewered area at the end of the delineation process.

**TABLE 1****SEWER SERVICE AREA CLASSIFICATIONS**

Code	Type	Description
<i>Sewered</i>		
S	Sewered	Areas adjacent to sewer lines, or with sewer lines running through them that contain at least one building and are served by the Sanitary Sewer System. These may be entire parcels or portions of parcels. Also includes roads that have sewer lines in them. Sewerlines that are traversing properties that are not sewered (without connections) will be buffered 5 feet on either side of the sewer, and this buffer will be considered sewered.
<i>Potentially Sewerable</i>		
U	Undeveloped	Undeveloped but potentially sewerable. (see note † below). Parcels that are listed as vacant or showing no improvement value in the King County Assessors Data and appear to be vacant in the 2000 aerial photo. The U classification only applies to entire parcels or groups of parcels that are undeveloped and not sewered.
D	Developed	Not sewered area that is developed and may be sewered in the future. (see note † below) Typically these are older residential areas that are served by individual On Site Sewage disposal systems (OSS, or septic tank and drainfield systems) The D classification only applies to entire parcels or groups of parcels that are developed and not sewered.
Y	Potentially sewerable area that is not sewered.	Y can be used to designate areas as potentially sewerable, without breaking down parcels or groups of parcels as U (undeveloped) or D (developed). Y is also used in undeveloped areas where development may be less dense than underlying zoning due to site constraints. If a parcel (or group of parcels) is partially sewered, Y is applied to the remainder of the parcel is vacant and potentially sewerable.
AGY	Agricultural	Parcels or portions of parcels currently in agricultural use. Includes parcels that are in State of Washington Current use Taxation programs. These programs discourage development through tax penalties, however the land is still potentially developable.



Not Sewerable		
A	Airfield	Portions of Airports that are not sewerred. The portions of airports connected to the sanitary sewer system such as control towers and buildings associated with maintenance or administration are considered sewerred.
AGZ	Agricultural	Fields under cultivation or which may potentially be cultivated. This Not Sewerable agricultural designation only applies to areas that are in King County Agricultural Production Districts (APD). It does not include Current use Taxation Parcels that are currently in agricultural use outside of APD. (see AGY in Sewerable). Farmhouses and buildings related to the processing of farm products, which may be connected to the sanitary sewer system are considered sewerred
AGZ (cont.)	Agricultural	
C	Cemetery	Portions of cemeteries that are not sewerred. Developed portions of cemeteries, such as administration buildings, that are connected to the sanitary sewer system are considered sewerred
FY	Freeway	Transportation corridors and associated right of way of major freeways and highways
G	Golf Course	Portions of golf courses that are not sewerred. Clubhouses, restaurants, and other buildings that are connected to the sanitary sewer system are considered sewerred
P	Private Park	Open space that is not likely subject to further development that is not publicly owned. This includes common areas associated with plats, multifamily complexes, and other commercial developments. These areas often have other constraints to development that might otherwise prevent them from being developed. In the case of multifamily and commercial development, the portions of the parcels connected to the sanitary sewer system are considered sewerred.
PP	Public Park	Public parks and public open space identified by King County Assessor's information. Includes publicly owned parcels that are not developed such as water tower areas. Developed portions associated with restrooms and other buildings connected to the sanitary sewer system are considered sewerred.



PR	Park & Ride	Publicly owned Park & Ride lots on separate parcels.
R	Recreational	Visually discernable recreational facilities including baseball diamonds, football fields, running tracks, tennis courts, etc. associated with public schools
RUR	Rural Areas	Areas on the Rural side of the Urban Growth Boundary (UGB). There are some minor exceptions to this rule due to permitted uses and sewer service provided prior to the establishment of the UGB.
RD	Retention / Detention Ponds	Retention / Detention Ponds. Stormwater control facilities identified by air photo and/or King County Assessors Data.
SB	Stream Buffer	Undeveloped areas adjacent to stream corridors. Varies with stream classification.
SS	Steep Slopes	Undeveloped areas having an average slope of 40 % or greater over 10-ft. of elevation, as determined using the steep slope coverage generated by WTD GIS. The WTD GIS staff used USGS maps at 20 ft contours along with Digital Elevation Model (DEM) coverages to create the steep slopes coverage. The 40% slope over 10 feet of elevation is the King County Sensitive Areas Standard for steep slopes. Some of these steep slope sensitive areas are included in other unsewerable areas such as parks and public parks and they have note be noted. Areas that are developed (D) or sewerd (S) and lie within the SS coverage are assigned their respective code, D or S.
SS (cont.)	Steep Slopes	
W	Water Body	Freshwater lakes, estuaries, lakes, and the lower portions of rivers wide enough to have been included in the County's Water Body coverage. Edge of the water body is considered to be the King county Shorelines coverage. This coverage may not follow parcel lines or the image of the waters edge in the aerial photo.
WF	Wetland/Floodplains	Undeveloped parcels in wetlands and floodplains as designated in King County GIS coverages used for this project.
Z	Parcels that are not sewerable but are not covered by the preceding definitions	Includes limited access publicly and privately owned parcels (SPU, Railroad Right of Way, etc.)

†Not sewerd areas that are potentially sewerable can be coded as U, D, or Y. U and D polygons indicate whether there is any current development on the property. However, in some cases Y was used to reduce the effort required to delineate the differences between developed and undeveloped areas that are not sewerd.